## CLAIMS

What is claimed is:

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1. A method for determining a set of weights for a set of arcs of a graph structure comprising the step of determining a genome representation for the weights such that the arcs of the graph structure that participate in a substructure of the graph structure are in a close proximity in the genome representation.

- 2. The method of claim 1, further comprising the step of evolving the weights using the genome representation.
- 3. The method of claim 1, wherein the step of determining a genome representation comprises the step of determining a matrix which indicates an optimal arrangement of the weights in the genome representation in response to the interconnections among a set of nodes and the arcs of the graph structure.
- 25 4. The method of claim 3, wherein the step of determining a matrix comprises the steps of:

determining a connection matrix which indicates interconnections among the nodes and the arcs;

determining a weight matrix which indicates an amount by which each element of the weight matrix is off a diagonal;

determining a product matrix of the connection matrix and the weight matrix.

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- 5. The method of claim 4, wherein the step of determining a matrix further comprises the step of determining a score by summing a set of elements of the product matrix.
- 6. The method of claim 5, further comprising the step of minimizing the score by swapping one or more rows and columns of the matrix.
- 7. The method of claim 1, wherein the graph structure is a neural network.
  - 8. A method for deriving a genome representation for a set of weights in a graph structure, comprising the steps of:

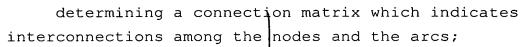
determining a substructure of the graph structure;

determining an arrangement in the genome representation such that the weights that participate in the substructure are in a close proximity in the genome representation.

- 9. The method of claim 8, wherein the step of determining an arrangement comprises the step of determining a matrix which indicates an optimal arrangement of the weights in the genome representation in response to the interconnections among a set of nodes and the arcs of the graph structure.
  - 10. The method of claim 9, wherein the step of determining a matrix comprises the steps of:

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determining a weight matrix which indicates an amount by which each element of the weight matrix is off a diagonal;

determining a product matrix of the connection matrix and the weight matrix.

- 11. The method of claim 10, wherein the step of determining a matrix further comprises the step of determining a score by summing a set of elements of the product matrix.
- 12. The method of claim 11, further comprising the step of minimizing score by swapping one or more rows and columns of the matrix.
  - 13. The method of claim 8, wherein the graph structure is a neural network.

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